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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,275	06/20/2003	Siyu Ye	130109.502	6444
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SEED INTELLECTUAL PROPERTY LAW GROUP PLLC 701 FIFTH AVE SUITE 6300 SEATTLE, WA 98104-7092				
EXAMINER YUAN, DAH WEI D				
ART UNIT PAPER NUMBER				
1745				

DATE MAILED: 07/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/601,275

Applicant(s)

YE ET AL.

Examiner

Dah-Wei D. Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 May 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-10 and 12 is/are rejected.  
7) ☒ Claim(s) 11 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

**METHOD OF MAKING A MEMBRANE ELECTRODE ASSEMBLY FOR  
ELECTROCHEMICAL FUEL CELLS**

Examiner: Yuan

S.N. 10/601,275

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June 28, 2006

**Detailed Action**

1. The Applicant's amendment filed on May 9, 2006 was received. Claim 13 was canceled. Claims 1,3,4,6,7,10-12 were amended.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on February 9, 2006.

***Claim Rejections - 35 USC § 102***

3. Claims 1-4,10 are rejected under 35 U.S.C. 102(e) as being anticipated by Kosako et al. (US 6,977,234 B2).

With respect to claim 1, Kosako et al. teach a method of making a membrane electrode assembly for a fuel cell comprising providing a first gas diffusion layer (10), provide a one-sided catalyst (6) coated membrane (2), providing a gas diffusion electrode having a second catalyst layer (14) and bonding the three layers to form a membrane electrode assembly. A hot pressing (sintering) process is used to bond the second catalyst layer and the gas diffusion electrode. See Embodiment 1; Figures 2 and 3.

With respect to claim 2, the two bonding steps occur simultaneously. See Figure 3.

With respect to claim 3, the catalyst layer further comprises a polymer electrolyte of a sulfonic acid-containing ionomer. See Column 19, Lines 34-50; Figures 12 and 13.

With respect to claim 4, Kosako et al. teach the second catalyst layer is an anode catalyst layer.

With respect to claim 10, Kosako et al. teach the gas diffusion layer and the catalyst layer are hot pressed (sintered) at 150°C. See Column 25, Lines 12-20.

***Claim Rejections - 35 USC § 103***

4. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10 above, and further in view of Oh et al. (US 2003/0108781 A1).

Kosako et al. disclose a method of making a membrane electrode assembly as described in Paragraph 3 above. However, Kosako et al. do not teach or suggest the addition of polytetrafluoroethylene in the catalyst layer. Oh et al. teach a method to make a membrane electrode assembly, wherein 20 wt% of PTFE is added to the catalyst layer. See Example 1. It is well known in the art that the use of PTFE in the catalyst layer can prevent the wetting of the catalyst particles. Therefore, it would have been obvious to one of ordinary skill in the art to add 20 wt% of polytetrafluoroethylene into the catalyst layer of Kosako et al., because it is well known in the art the PTFE can improve the hydrophobicity of the catalyst in the catalyst layer.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10 above, and further in view of Yoshida et al. (US 2003/0091891 A1).

Kosako et al. disclose a method of making a membrane electrode assembly as described in Paragraph 3 above. Kosako et al. teach the catalyst layer comprises conductive carbon

particles of Ketjen black carbon. See Example 1. However, Kosako et al. do not teach or suggest the addition of acetylene carbon black in the catalyst layer. Yoshida et al. teach the catalyst composition comprises carbon powder selected from the group consisting of furnace black, acetylene black, thermal black, channel black, and Ketjen black. See Paragraph 22. Therefore, would have been obvious to one of ordinary skill in the art to substitute an acetylene carbon black for the Ketjen black carbon in the membrane electrode assembly disclosed by Kosako et al., because Yoshida et al. teach the two are considered functionally equivalent conductive carbon powders.

6. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kosako et al. as applied to claims 1-4,10,13 above.

With respect to claim 12, the disclosure of Kosako et al. differs from Applicant's claims in that Kosako et al. do not describe the application of an ionomer solution to the surface of the catalyst layer after the sintering step. Kosako et al. teach the user of perfluorocarbon sulfonic acid ionomer can improve proton conductivity and reduce internal resistance. See Column 29, Lines 27-41. Therefore, it would have been obvious to one of ordinary skill in the art to an ionomer solution to the surface of the catalyst layer after the sintering step, because Kosako reference teaches the resulting proton conductivity can be enhanced and the internal resistance can be reduced.

***Allowable Subject Matter***

7. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 11 would be allowable because the prior art does not disclose or suggest the sintering of the anode catalyst layer is at a temperature between about 330° and 420°C.

***Response to Arguments***

8. Applicant's arguments filed on May 9, 2006 have been fully considered but they are not persuasive.

*Applicant's principle arguments are*

*Kosako does not teach the step of providing a sintered catalyst layer coated on the second gas diffusion layer.*

In response to Applicant's arguments, please consider the following comments.

Kosako reference teaches the half-cells (13,14) are laminated and bonded with the use of a hot pressing machine at 150°C. See Embodiment 1, Example 3. On the other hand, the term "sinter" is understood as to become a coherent mass by heating without melting. See Merriam Webster's Collegiate Dictionary, tenth edition. It is concluded that the hot pressing at 150°C is considered as a sintering process because it bonds the diffusion layer together with the catalyst layer at an elevated temperature.

*Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

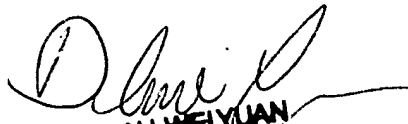
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications

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may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan  
June 28, 2006



DAH-WEI YUAN  
PRIMARY EXAMINER